Linear Programming 1 0809

1) The Elite Tweet Pottery Shop makes two kinds of birdbaths: glazed and unglazed. The unglazed birdbath requires ½ hour to throw on the pottery wheel and 1 hour in the kiln. The glazed birdbath takes 1 hour on the wheel and 6 hours in the kiln. The wheel is available for at most 8 hours a day, and the kiln is available for at most 20 hours a day. The pottery shop's profit on each unglazed birdbath is $10, while its profit on each glazed birdbath is $15. How many of each kind of birdbath should be produced in order to maximize profit?

2) Xavier, Yolanda, and Zeus have a small business producing handmade shawls and afghans for the Mathematics Teachers Retirement Home. They spin the yarn, dye it, and weave it. A shawl requires 1 hour of spinning, 1 hour of dyeing, and 1 hour of weaving. An afghan needs 2 hours of spinning, 1 hour of dyeing, and 4 hours of weaving. They make a $16 profit per shawl and a $20 profit per afghan. Xavier does all the spinning and can spend at most 8 hours, Yolanda does all the dyeing and can spend up to 6 hours, and Zeus does all the weaving and can spend up to 14 hours. How many of each item should they make to maximize their profit?

3) The International Canine Academy raises and trains Siberian sled dogs and dancing French poodles. Breeders can supply ICA with at most 20 poodles and 15 huskies each year. Each poodle eats 2 lbs. of food a day and each sled dog will eat 6 lbs. a day. ICA food supplies are restricted to at most 100lbs. of food each day. Poodles require 1000 hours of training per year, while a sled dogs requires 250 hours a year. The ICA restricts training time to no more than 10,000 hours each year. How many of each kind of dog should the ICA breed in order to maximize profit if each poodle sells for $200 and each sled dog sells for $80?